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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

PARTS STOREKEEPER (whole. tr.) 1-75.24

B-433
or
S-167

T: 001 599

U. S. Employment Service in
Cooperation with
California State Employment Service

U. S. DEPARTMENT OF LABOR
Bureau of Employment Security
Washington 25, D. C.
April 1960

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GATB #2269
June 1959

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY FOR PARTS STOREKEEPER 1-75.24

B-433 or S-167

Summary

The General Aptitude Test Battery, B-1002A, was administered to a total sample of 53 men employed as Parts Storekeeper 1-75.24 at eleven wholesale auto parts stores in Southern California. The criterion consisted of supervisory ratings based on a descriptive rating scale. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes G-Intelligence, N-Numerical Aptitude, and Q-Clerical Perception were selected for inclusion in the test norms.

GATB Norms for Parts Storekeeper 1-75.24 B-433 or S-167

Table I shows, for B-1001 and B-1002, the minimum acceptable score for each aptitude included in the test norms for Parts Storekeeper 1-75.24.

TABLE I

Minimum Acceptable Scores on B-1001 and B-1002 for B-433 or S-167

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-H CB-1-I CB-1-J	95	G	Part 3 Part 4 Part 6	90
N	CB-1-D CB-1-I	95	N	Part 2 Part 6	90
Q	CB-1-B	95	Q	Part 1	95

Effectiveness of Norms

The data in Table V indicate that 8 of the 14 poor workers, or 57 percent of them, did not achieve the minimum scores established as cutting scores on the recommended test norms. This shows that 57 percent of the poor workers would not have been hired if the recommended test norms had been used in the selection process. Moreover, 31 of the 37 workers who made qualifying test scores, or 84 percent, were good workers.

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TECHNICAL REPORT

I. Problem

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Parts Storekeeper 1-75.24.

II. Sample

The General Aptitude Test Battery, B-1002A, was administered during the period February 5 to May 11, 1959 to a sample of 61 men employed as Parts Storekeeper 1-75.24 at eleven wholesale auto parts stores in Southern California. These stores were members of the California Automotive Wholesale Association. The potential sample included 162 male employees. The sample of 61 men was selected by employers as being representative of a cross section of the industry. Of the 61 workers tested, 8 were eliminated from the sample; seven whose comparability of total experience was not representative of workers generally found in this occupation (27 to 42 years), and one who had difficulty with the apparatus tests as a result of a recent attack of paralysis. Thus, the final sample consisted of 53 men.

The names of the participating members of the California Automotive Wholesale Association, location, number of workers in the sample, and dates of testing for each are as follows:

Name	Location	Number	Testing Dates
Allbrights Auto Parts	Riverside	8	April 8, 1959
Boggs and McBurney	Santa Monica	5	May 11, 1959
Covina Auto Parts	Covina	3	(March 24, 1959 (April 21, 1959
Encell Auto Parts	Los Angeles	3	(March 7, 1959 (April 4, 1959
Graves Auto Parts	Ontario	2	(March 24, 1959 (April 21, 1959
Lambert Company	Los Angeles	12	(March 7, 1959 (April 4, 1959
Monrovia Motor Parts	Monrovia	2	(March 24, 1959 (April 21, 1959
H. M. Parker & Sons	Glendale	2	March 17, 1959
Pomona Auto Parts	Pomona	5	(March 24, 1959 (April 21, 1959
Sturdevant Motor Parts	Van Nuys	6	(March 17, 1959 (May 4, 1959
Westernlund & Lang	San Diego	5	February 5, 1959
	TOTAL	53	

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Member establishments of the association have not presently, nor have they in the past, employed tests in the selection of workers for this occupation. Job applicants are required to prepare a standard employment form and have an oral interview with the store or parts manager. Workers with 1 to 5 years of wholesale experience, rather than retail, in the automotive parts are preferred. Trainees are selected on appearance, interests, and mechanical training. All prospective employees must speak, read and write English, have the ability to deal with the public, and be bondable. Formal education is not required.

The industry has not established formal or special training procedures. Trainees are assigned entry jobs in the stock, shipping, and receiving departments, or as delivery boys. Progress towards counter work is dependent upon trainee's initiative, adaptability, and employer's need for additional countermen. The average duration of training time is from one to two years including the time spent in entry classifications. All workers in the sample are considered experienced workers.

Table II shows the means, standard deviations, ranges, and Pearson product-moment correlations with the criterion for age, education, and experience.

TABLE II

Means (M), Standard Deviations (σ), Ranges, and
Pearson Product-Moment Correlations with the Criterion (r)
for Age, Education, and Experience

Parts Storekeeper 1-75.24
N = 53

	M	σ	Range	r
Age (years)	38.8	9.9	21-64	.184
Education (years)	11.9	1.7	7-16	.125
Experience (months)	95.4	59.6	24-264	.255

There are no significant correlations between age, education, or experience and the criterion. The data in Table II indicate that the sample is suitable for test development purposes with respect to age, education, and experience.

III. Job Description

Job Title: Parts Storekeeper 1-75.24

Job Summary: Sells automotive parts and equipment and advises on the substitution and modification of parts. Visually inspects damaged parts and ascertains whether replacements are available by consulting catalog. Measures parts for which there are no replacements, using micrometers or gages and determines whether similar parts may be machined down or built up to required size. Serves customer at counter, determining merchandise desired and ascertaining make, model, type and/or size of item requested by direct questions. Serves customer by phone, answering phone calls at counter or at order desk and

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recording information for requested parts. Fills phone or mail orders, and sends order to purchasing agent for back-order on items not in stock. Receives shipments, unpacks and checks merchandise against invoices, and enters any shortages on shipping ticket. Assists in taking periodical inventories of stock and requisitions replacement of merchandise as necessary.

Work Performed: Serves customer, determines merchandise desired and ascertains make, model, type and/or size of item requested by direct questions. Visually inspects any damaged part brought in by customer. Consults parts catalog for information, to identify part by code number and price. Gives customer information concerning specific part; and, when feasible, advises on substitution of parts when original make or type is no longer available or manufactured. Measures part for which there is no replacement, using micrometers or gages and determines whether they can be modified by machining down or building up part to required size. Procures merchandise requested by customer from stock room and assembles order at counter. Prepares sales slip or sales contract designating merchandise by code number, description, quantity, price and computes total price of sale including tax. Accepts payment from customer, rings up sale on cash register, deposits cash received and makes change. Procures customer's signature on sales document if purchase is to be charged or sent C.O.D. Secures credit authorization on new charge accounts personally or by phone, from credit department. Gives change, copy of sales slip, and merchandise to customer, or, if it is to be delivered, takes merchandise to shipping department and places in shipping bin with copy of sales slip. May specialize in one line or item such as truck parts, foreign car parts, or paints and lacquers.

Serves customer by phone: Answers phone calls at counter or at order desk. Gives general or specific information consulting parts catalog as a source of information when necessary. Answers technical questions, discusses item with customer relative to its application, employing knowledge of parts, specifications, capabilities and limitations. Records information for requested part(s) on scratch pad or on order form. Advises customer when delivery may be expected and thanks him for his order. Prepares or completes order form showing essential purchase information such as part number, unit price, quantity, total amount of sale, cash, C.O.D. or credit, and shipping instructions. May keep card file on repeat customers.

Fills phone or mail orders: Picks up order form or customer's letter from order desk and determines merchandise requested. Consults parts catalog for necessary specifications and location in stock room. Procures merchandise from stock room and places items in shipping room bin. Enters any shortages and deletions on shipping ticket. Prepares and sends order to purchasing agent for back-order on items not in stock. Authorizes C.O.D., or secures authorization from credit department. May call customer to transmit information regarding shortages of stock and advise him when delivery may be expected. Fills back-orders as new merchandise is received.

Performs other related duties: Receives shipments, unpacks, and checks merchandise against invoices and enters any shortages on shipping ticket. Marks parts by code number indicated in catalog and stores parts in stock room according to prearranged plan. Sets up and arranges merchandise displays. Assists in taking periodical inventories of stock and requisitions

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replacement of merchandise as necessary. Posts corrections and additions in parts catalog. Attends regular group meetings after working hours for specialized training. May pack, determine route and type of carrier and pastes appropriate label on merchandise to indicate that items are fragile and/or to indicate terms of delivery such as C.O.D. or Special Delivery. May weigh merchandise, consult rate tables to determine postage or freight due and record delivery information such as volume of merchandise shipped, type of carrier, cost of shipment and records of merchandise returned to manufacturer. May drive light truck to make local deliveries.

IV. Experimental Battery

All of the tests of the GATB, B-1002A, were administered to the sample group.

V. Criterion

The criterion for this study consisted of supervisory ratings based on the Descriptive Rating Scale developed by the Bureau of Employment Security, Form SP-21. The supervisor prepared ratings and reratings for each worker with a time interval of two weeks to twenty-two days between the first and second ratings. The rating scale consisted of 9 items covering different aspects of job performance with five alternatives for each item. Weights of one through five indicating the degree of job performance attained were assigned to each alternative. A correlation coefficient of .85 was obtained between the two sets of ratings. This indicated a satisfactory degree of reliability. The final criterion score consisted of the combined rating scale scores. The possible range of scores was 18 through 90. The actual range was 52 through 84 with a mean score of 67.5 and a standard deviation of 7.9.

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis: The job analysis indicated that the following aptitudes measured by the GATB appear to be important for this occupation.

Intelligence (G) - required to acquire and retain knowledge of various parts; to obtain technical information and provide customer with information; and to exercise judgment in advice on substitution of parts.

Verbal Aptitude (V) - required to answer telephone calls; to ask pertinent questions to determine merchandise desired by customer; to answer technical questions and explain uses of parts; and to provide other information.

Numerical Aptitude (N) - required to compute prices and sale taxes; to accept payments and give change; to measure parts and determine if they can be machined to required size; and to use micrometers and gages.

Form Perception (P) - required to visually inspect damaged parts and to identify parts in catalog.

Clerical Perception (Q) - required to consult catalog for code numbers and prices of parts; to prepare sales slips and order forms; to fill mail orders; to check merchandise received against invoices; and to mark and stamp parts.

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On the basis of the job analysis data, none of the aptitudes were considered obviously unimportant for performing the duties of this job. Therefore, no aptitude was considered "irrelevant".

B. Statistical Analysis: Table III shows the means, standard deviations, and Pearson product-moment correlations with the criterion for the aptitudes of the GATB. The means and standard deviations of the aptitudes are comparable to general population norms with a mean of 100 and a standard deviation of 20.

TABLE III

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB

Parts Storekeeper 1-75.24
N = 53

Aptitudes	M	σ	r
G-Intelligence	110.6	11.3	.087
V-Verbal Aptitude	108.9	13.6	.113
N-Numerical Aptitude	108.0	9.7	.204
S-Spatial Aptitude	106.6	17.8	-.033
P-Form Perception	100.5	14.5	-.006
Q-Clerical Perception	101.9	14.1	.205
K-Motor Coordination	100.5	15.6	.206
F-Finger Dexterity	93.7	21.0	-.188
M-Manual Dexterity	91.3	21.3	.189

Aptitudes G, V, and N have the highest mean scores and Aptitudes G, V, N, and Q have relatively low standard deviations.

For a sample of 53 cases, correlations of .351 and .271 are significant at the .01 level and the .05 level of confidence, respectively. None of the aptitudes correlate significantly with the criterion for this sample.

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C. Selection of Test Norms

TABLE IV

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data Important	X	X	X		X	X			
Irrelevant									
Relatively High Mean	X	X	X						
Relatively Low Sigma	X	X	X			X			
Significant Correlation With Criterion									
Aptitudes to be Considered for Trial Norms	X	X	X			X			

Trial norms consisting of various combinations of Aptitudes G, V, N, and Q with appropriate cutting scores were evaluated against the criterion by means of the tetrachoric correlation technique. A comparison of the results showed that several sets of B-1002 norms with identical four-way tables had the best selective efficiency for this sample. These norms are: (1) G-90, V-90, Q-95; (2) G-90, N-90, Q-95; (3) V-90, N-90, Q-95; (4) G-90, V-90, N-90, Q-95; and (5) V-90, Q-95. In such instances the set of norms which is most suitable in terms of qualifying the study to be tried for incorporation into the OAP structure is selected. The set of norms consisting of G-90, N-90, and Q-95 was the only set which qualified for incorporation into the OAP structure. These norms qualify the study to be tried for incorporation into OAP-6. Thus, the final B-1002 norms consist of G-90, N-90, and Q-95.

VII. Validity of Norms

The validity of the norms was determined by computing a tetrachoric correlation coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by using a combined rating scale score of 63 as the criterion critical score. This division was set because the 4-point spread between the scores of 59 and 63 seemed to divide the more proficient workers from the less proficient workers. Setting a criterion critical score of 63 resulted in 14 of the workers or 26 percent of the sample being placed in the low criterion group.

Table V shows the relationship between test norms consisting of Aptitudes G, N, and Q with critical scores of 90, 90, and 95, respectively, and the dichotomized criterion for Parts Storekeeper 1-75.24. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

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TABLE V

Validity of Test Norms (G-90, N-90, Q-95)

N = 53

	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	8	31	39
Poor Workers	8	6	14
Total	16	37	53

r_{tet} = .57 X^2 = 4.936

$\sigma_{r_{tet}}$ = .24 P/2 < .025

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes G, N, and Q with minimum scores of 90, 90, and 95 respectively have been established as B-1002 norms for the occupation of Parts Storekeeper 1-75.24. The equivalent B-1001 norms consist of G-95, N-95, and Q-95.

IX. Determination of Occupational Aptitude Pattern

A significant relationship between OAP-6 and the criterion for the experimental sample was obtained. The proportion of the sample screened out by OAP-6 was .34 which is within the required range of .10 to .60. Therefore, the occupation of Parts Storekeeper 1-75.24 will be allocated to OAP-6.